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ABSTRACT

Many influential style guides endorse the stylistic prescription that writers, particularly technical writers, should revise noun compounds into phrasal or clausal paraphrases. While the prescription is well-intentioned, it fails to take into account that a reader's comprehension of compounds, whether long or short, is a complex process dependent upon that reader's prior knowledge. In addition, the prescription ignores the fact that what retards one reader's comprehension of a compound may not retard--and might even facilitate--the comprehension of another. Therefore, in making their decisions about whether to use or revise noun compounds, writers must consider the intended reader. To help in this effort, they should apply four tests that order the decision criteria into a heuristic. Applied in order, the tests require the writer to determine if a compound (1) falls within a intended reader's general, technical, or idiomatic knowledge; (2) functions as a common, easily understood way of expressing an idea; (3) presents ideas efficiently; and (4) is stylistically efficacious. If the compound survives all four tests, it should remain intact; if it fails even one, it should be revised. The four tests form the basis of a theory of prescriptive style, but not a theory of comprehension. Theories of how readers understand noun compounds can lead writers to produce even more specific heuristics for using and revising them. (FL)

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On Revising Noun Compounds: Four Tests

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Abstract

Since Lees' work in the sixties, linguists have understood that noun compounds can be paraphrased into phrases and clauses that are always less compact and usually less ambiguous than nominal forms. The idea that writers should revise lengthy noun compounds into phrasal or clausal paraphrases has now become a stylistic prescription endorsed by influential style guides, notably Williams. While we have no argument with this prescription, our aim is to show how decisions to revise (or not to revise) noun compounds involve a writer in deliberations beyond style alone. They also require the writer to deliberate about the frequency of the compound, how efficient it is in expressing intended concepts, whether it arises within a technical or nontechnical setting and, most importantly, what the reader knows. We offer four tests that order these decision criteria into a heuristic for writers.

In a brief section of his fine book on style, Joseph Williams[1] offers a mixed report card on the appropriateness of noun compounds in English prose. On the one hand, he disagrees with "the many grammarians [who] insist that we should never modify one noun with another." He observes that such a rule would prevent us from using common phrases like stone wall, student committee, and radio telescope. On the other hand, he asserts that most noun compounds

> are awkward or, worse, ambiguous, especially when they include one or more nominalizations. They may be more economical than the fully articulated phrase, and they may be entirely acceptable in scientific and technical writing. But they are graceless all the same. And when we recognize their potential ambiguity, we may decide that in the long run the very slight economy in words is a bad bargain.

The worst of these bad bargains are the tortuous compounds we associate with technical and bureaucratic writing:

> early childhood thought disorder misdiagnosis
> air quality regulation announcements
> narrative information extraction rules
> computer human cognition simulation games
> determination of support appropriateness

Williams' mixed evaluation prompts the following question: what distinguishes noun compounds that require revision[2] from those that don't? The importance of answering this question should not be overlooked; for if students (particularly of technical writing) can't make these discriminations in practice and if we can offer no explicit guidelines to assist them when they try,

they will have difficulty deciding when to revise a noun compound and when not to.

Williams' own discussion does not attempt an answer. His chief concern lies with showing writers how to unpack long noun strings into less ambiguous phrasal and clausal paraphrases.[3] While this focus is well-motiva[illegible], it leaves unaccounted for the following important facts: (1) the comprehensibility of noun compounds, long or short, is seldom an open and shut case; (2) more important than length, comprehensibility crucially turns on the knowledge a reader can bring to these compounds; (3) what retards the comprehension of one reader may not retard (but even facilitate) the comprehension of another. Even a short compound like "car search" can seem paralyzingly ambiguous to a reader lacking contextual knowledge; even a longer compound like "time critical equipment" can seem concise, unambiguous, and lucid to a space engineer.[4]

Writers deciding whether to use, not use, or revise noun compounds must therefore take into account their reader's knowledge. Useful guidelines, we feel, should also ask writers to weigh the familiarity, efficiency, and stylistic efficacy of the compound against alternatives for particular audiences. Presented as four tests ordered from first to last considered, our guidelines read as follows:

Reader Knowledge Test

1. Can the reader understand the compound? If not, the writer should opt for a less abbreviated mode of expression or a different strategem that better adapts to the reader's knowledge.

Common Usage Test (assumes the compound passes test 1)

2. The reader can understand the compound. But are there more common ways of expressing the ideas it conveys that are also more appropriate to the writing context or style? If so, the writer should opt for these alternatives unless he or she intends to coin the compound as a common expression.

Efficiency Test (assumes the compound passes tests 1,2)

3. The reader can understand the noun compound and the noun compound is a common usage appropriate to the writing context. But does the common usage hide simple ideas behind a complex or oblique veneer? Could the audience understand the ideas with less effort, with more insight, if the common usage were overridden? If so, the writer should select an alternative expression that conveys the ideas in simpler or more direct wording.

Stylistic Efficacy Test (assumes the compound passes tests 1,2,3)

4. The reader can understand the noun compound as a common usage that doesn't needlessly complicate the ideas expressed. But would the writer's communicative interests in a smooth stylistic flow and in an appropriate tone and emphasis be further advanced if the compound were revised? If so, the writer should unpack the compound into a head followed by prepositional or relative modifiers. (This test echoes Williams' and other stylists' interest in revising noun compounds--as a way of improving a sentence's flow, tone, and emphasis--and repeats their advice for unpacking them. Yet it goes farther in specifying <u>when</u> to do so.)

If the compound in question survives all four tests, it should remain intact. If it fails even one, it should be revised. We devote the balance of this paper to discussing each test in greater detail.

1. <u>The Reader Knowledge Test</u>. The writer conducts this test by asking, can the reader unambiguously understand the compound with ease, without double-takes or noticeable inferencing? In fact, the writer should first apply the test to his or her own

understanding. For, as every writer knows, it is all too easy to string nouns together thoughtlessly instead of considering what one really means; to use noun compounds as habitual padding for ideas too weak to stand scrutiny or too thin to merit acclaim; or to affect them as a professional cover to keep uncritical readers properly intimidated.

It is very difficult in the abstract to record all the factors that bear on how we understand noun compounds. But we can point to sources of knowledge on which the reader can be expected to rely and thus offer the writer some important premises from which to make inferences about what the reader reasonably can know--or can't.

a. The reader's idiomatic knowledge. We so often think of noun compounds in connection with the special jargon of the sciences and the professions that we tend to overlook their role in everyday discourse. In fact, many noun compounds behave like commmon idioms in that they are common expressions whose meanings can't be strictly deduced from their parts but must be holistically understood (in much the way we understand "spill the beans" as "to disclose carelessly" without working through the individual meanings of "spill" and "beans."). Some examples:

pick-up truck
two-passenger car
T.V. dinner

Any vehicle used for hauling can be associated with a "pick-up," but a pick-up truck refers to a special type of truck. A two-passenger car does not refer to any car that carries two passengers, but to a car with a seating capacity of two persons. A T.V. dinner does not refer to any meal accompanied by T.V., but to a frozen food product. Compounds that rely on idiomatic knowledge offer little resistance to readers who have been exposed to them and their specialized meanings--and this will include most adult readers in the culture.

b. The reader's general knowledge. Readers can be expected to have acquired a wide variety of information over the course of their normal experience and education. Unlike idiomatic knowledge, which refers to a reader's knowledge about a particular noun compound and its specialized meaning, general knowledge refers to a reader's knowledge about the objects, properties, states, and relations that the compound brings together. With general knowledge about whirlpools and health, for example, one will likely be able to make sense of "whirlpool health maintenance programs"; with general knowledge about watches and requisitions, "watch repair requisitions." Consider the following list:

underground oil	data entry
petroleum product	law enforcement official
oil embargo	police search
gas shortage	burn victim
auto industry	skin graft
consumer demand	interest rate

One would expect comprehension of these compounds to be based on the reader's general education, experience, and socio-economic status.

c. The reader's technical knowledge. Certain knowledge comes with expertise in a particular domain:

direct injector stratified charge engine
accessory power requirements
optical character recognition input
vehicle body longtitudinal structural design
product strip surface inspection
gas tube power pulse modulator switch

Not surprisingly, the noun compounds which require technical knowledge to decipher are the ones with the most selective readership. While it seems impermissable for compounds intended for general readers to convey information more dense than the information conveyed in a simple sentence, compounds based on technical knowledge can pack as much information as members of the technical field can understand.

These compounds pose no unusual problems until an expert in a domain uses them to communicate to a nonexpert. At that time, one of two problems of nonunderstanding may arise.

(1) The reader will understand the concepts employed by the compound, but will not be able to choose among ambiguous ways of relating them. Consider the compound "optical character

recognition input." Assume that lay readers can understand the individual meanings of the embedded concepts, but lack an understanding of how computer scientists mean to relate them. Lay readers will find several parsings possible:

> input by characters for optical recognition
> input of characters for optical recognition
> the recognition of characters through optical input
> the recognition input of optical characters
> the recognition of input through optical characters

Yet the expression actually refers to the input of characters through optical recognition. To resolve this sort of ambiguity, writers must unpack the compound, as we have, through prepositional phrases or some other type of elaborative syntax.

(2) The reader will not understand the concepts within the compound and so will find it useless to attempt interpretations. A lay reader who is unfamiliar with concepts in the compound "higher order quantification representation" may not even try to guess what the writer intended the compound to mean. Unpacking the compound into "representation of higher order quantification"--a good strategy for the first type of technical nonunderstanding--will not help here. Writers in these cases need to recognize that unpacking strategies will not alone bring their readers to an understanding of what the compound means. Readers will also need explicit definitions of the concepts embedded therein.

If a noun compound passes the reader knowledge test, it is because the writer determines it to be within the grasp of the reader's idiomatic, general, or technical knowledge. However a writer may determine that a particular compound can pass this test and may still choose to revise it based upon its performance on the remaining tests.

2. The Common Usage Test. The writer performs this test by asking, does the compound provide for its targeted readers an easy to recognize, even standardized, way of expressing the ideas associated with it? Or does it pose a puzzle that could have been avoided through alternate expression?[5] Common usage is a very powerful test for screening noun compounds intended for general readers because very few compounds longer than two words achieve common status for general readers unless they name objects familiar to common experience (e.g., health care unit, driver's license test).

Two-word compounds seem to put significantly fewer processing demands on readers than compounds of greater length--and this difference may underlie the advantage two-word compounds show in achieving common usage status among such readers. If nothing else, the common usage test should arouse the suspicions of one who writes for the general reader against compounds of length three or more that do not function as common names.

Common usage turns out to be a far weaker, less conclusive, test for screening noun compounds intended for technical readers. Considerations of length are much less decisive in predicting whether a compound has (or can) achieve the status of a common use. Compounds expressing technical ideas can enjoy widespread use (within narrow communities) even when four or five words long.

Within technical communities, moreover, the value of conforming to common usage competes with a contrary value--to create new knowledge and thus to coin new vocabularies to express it. The common usage test applies only when a writer can find a more common expression for the same ideas expressed by the compound. If the ideas are original, however, and a noun compound (e.g., screen-oriented text editor) is used to christen them, then the noun compound will pass the common usage test by default. Cases of noun compounds used as christening devices are legion in technical prose. Because nouns can be strung together as building-blocks, noun compounds guarantee, as McNeil notes, that "new technical terms will be available when needed."[6]

3. The Efficiency Test. A writer conducts this test by asking whether the ideas expressed by the compound could not be as informatively expressed in fewer, simpler, or more direct words. The efficiency test is a diametrical opposite of the common usage test in that it is the strongest test for deciding to revise noun

compounds targeted for a technical readership; but it proves to be a very weak test for deciding to revise compounds earmarked for general readers.

Indeed, any compound marked for general readers that passes the reader knowledge and common usage test will likely pass the efficiency test. In nontechnical writing, efficiency does not constitute an independent criterion for evaluating a noun compound. The efficiency of a compound rather provides a reason for its becoming a standardized usage. A compound like "consumer demand," for example, will become a standardized usage because it is efficient, because it says in fewer words what "the demands of consumers" says.

But within technical communities, where jargon reigns, the criteria of efficiency and common usage are not so strictly intertwined. Some technical compounds enjoying wide acceptance will express ideas efficiently; others will not.

For example, the compound "procedure call overhead," meaning the costs involved in executing a piece of code, is a locution known to all computer scientists. The phrase is efficient, furthermore, because in three words it references a collection of ideas that consumes paragraphs and even books. The compound "input/output user access facility" is also readily understood by users at at least one computer facility as the place to leave

jobs or pick up output. Yet this phrase, despite common usage, is not efficient; the same idea could be communicated by the words "input/output window," "user window," or simply "window."

The technical writer appeals to the criterion of efficiency to distinguish useful from useless jargon.

The efficiency test enforces an important check against the idea that common practice within technical communities is alone a sufficient criterion for members to judge their own jargon acceptable. For, as every technocrat knows, it is all too easy to settle into jargon that diminishes good ideas by burying them in excessive verbiage--even if that verbiage is "understandable within the organization."

4. The Stylistic Efficacy Test. A writer conducts this test by asking what kinds of stylistic demands the intended readers will be imposing. An understanding of these stylistic demands is important, for, as Christensen,[7] Lanham,[8] Williams,[9] and other stylists have observed, heavy noun phrases are a mark of a graceless, plodding, ponderous, style.

Noun compounds lend to prose a "heavy" quality as long as readers must process each part of the compound "one at a time." For example, a sentence like

The vehicle body longtitudinal impact load should be increased.

requires the reader to understand a five-noun chunk as the sentential subject. One's reading rate slows on such compounds, presumably, because the reader processes "vehicle" as a single unit, then must tie the meaning of this unit to the meaning of "body," then must tie the meaning of "longtitudinal" either to the meaning of "vehicle," "body," or "vehicle body" and so on down the line. Consequently, the reader who demands "ease of flow" will surely feel annoyed at writers who use heavy noun compounds too freely.

Fortunately, readers are likely to place the highest fluency demands on writers with the most opportunities to avoid noun compounds. Thus the stylistic efficacy test is likely to be a stronger test for eliminating noun compounds in nontechnical rather than technical prose. Still, within technical as well as nontechnical settings, this test gives a writer a "last resort" justification to unpack heavy compounds that have passed the three previous tests. Through it, a writer can decide that the flow, tone, and emphasis he or she would like to communicate from ideas in (1)

(1) The Wesley latching relay box terminal strip was broken during shock testing.

might be better expressed by the more unpacked (2)

(2) The terminal strip on the Wesley latching relay box was broken during shock testing.

than even by the more fully unpacked (3)

(3) The terminal strip on the latching relay box made by Wesley was broken during shock testing.

Writers do not apply the stylistic efficacy test correctly if they mechanically reduce noun compounds wherever they find them. On this simplistic strategy (3) would necessarily be preferable to (2) and (4) would necessarily be preferable to (3)

(4) The strip called terminal on the box that latches relays made by Wesley was broken during testing that applied shocks.

Rather, writers apply the test correctly when they reduce compounds in conjunction with the flow, tone, and emphasis that best fits their communicative goals.

What considerations of flow and emphasis would affect a writer's decision to prefer (2) over (1) and (3)? Normally in good writing, we want to signal <u>important</u> information to readers by placing it at regular intervals and at the end of natural parsing units--phrases, clauses, and sentences. Heavy noun compounds can delay this flow and thus interfere with these signals, however, by leading readers to think they have come to the end of a phrase prematurely. When reading "Wesley latching relay box terminal strip," left to right, for example, it is tempting to want to "close" the phrase at "relay," then at "box" and so on down the line. Because each of these nouns competes for the end-of-the-phrase (or head) slot, the intended head noun

loses the highlighting it deserves and readers are left to their own devices to "feel out" the word intended as head.

By breaking up a noun compound, a writer can give the important information "trapped" within it its due prominence. And so, if we want to emphasize "terminal strip", (2) is a better choice than (1) because in (2) "terminal strip" is not only the unambiguous subject of the sentence, but also does not compete with other nouns for the end of the subject phrase. Analogously, by not breaking up a noun compound, a writer can signal that information in the slots preceding the head requires less marking. Thus, if we want to deemphasize "Wesley", (2) is preferable to (3) because (3) makes "Wesley" the terminal slot in the phrase "made by Wesley"--and, contrary to our communicative goals, marks it as important.

We have suggested that long noun compounds can throw off a reader's expectations about the flow (or distribution) of important information as signaled by the ends of parsing units. We have used this observation to explain why keeping information stacked in noun compounds can give it less emphasis and why unpacking information from noun compounds can give it more. But what determines whether we will want to give nominal information emphasis or not?

One answer is that such information should be emphasized when

it refers to (or carries) the topic of discourse. This generalization nicely handles our present examples, where we want to give more emphasis to topical information (terminal strip) and less information to nontopical information (Wesley). We might want to generalize further from this and say that information ought not to be expressed in noun compounds if it is topical. But this conclusion misses the fact that we commonly express topical information as the head noun of a noun compound when the information is well-known and established from prior experience or from the immediate text itself. As an example of the latter, consider the following discourse,

The United States Senate announced that grain sales to the Soviet Union have been curbed. The government grain curb will go into effect....

Here "government grain curb" is topical, though expressed as a noun compound. In general, noun compounds expedite, rather than impede, the normal flow of discourse when the information they contain refers, even if elliptically, to something the reader clearly knows about. In fact, with familiarily, readers seem able to recode noun compounds into single units of meaning--to take in "longtitudinal impact load" in a flow no more delayed nor disrupted than had they read "load."[10]

This leads us to a better generalization about when to emphasize nominal information: We should emphasize it--and thus should not want to express it in noun compounds--when our readers

find it new and unfamiliar. The converse of this generalization also proves useful: old, established information is stylistically well-suited for expression in noun compounds.

As it happens, these generalizations help explain the effects of using noun compounds on the tone the writer projects (knowingly or not) to the reader. If appropriately used, noun compounds can help writers convey a sense of closeness and intimacy with readers. Writers can take advantage of the fact that they and their readers share special interests and credentials that allow them a form of communication that is at once abbreviated, quick, and dense.

If inappropriately used, however, noun compounds may suggest to readers that the writer had expected them to know more than he or she had a right to expect. They may further think that the writer's (unwarranted) expectation has compromised their own right to understand the text--or at least their right to understand it with maximal understanding for minimal effort. Readers who feel their rights threatened in this way may take noun compounds as a sign of the writer's incompetence, bureaucratic disregard, discourtesy, or disdain.

Williams seems to appeal to stylistic efficacy as support for eliminating all but the most common of the most commonly used noun compounds (e.g., stone house, student committee, etc.) from

nontechnical writing.[11] However the outcome of the stylistic efficacy test either in technical or nontechnical domains can't be adequately assessed without considering the writer's understanding of the readers' knowledge, the writer's communicative goals, and the writer's judgments of how readers will fare inferring those goals.

Some advocates of the "plain language movement" beg important questions when they assume that all prose (technical or nontechnical) can be reduced to a common denominator of "stylistic clarity," when they assume that prose that shows a complex veneer invariably hides a simple message expressible in a simple style. In fact the teachings of that movement, which include proscriptions against overreliance on noun compounds, make most sense when addressed to contexts where experts in a technical field must communicate to nonexperts (e.g., legal contracts, insurance contracts, manufacturer warranties, medical consent forms, etc.), where a noncompact style avoids expressing too much new information too quickly. However, the alleged "positive value" of a noncompact style becomes suspect when one considers how technical experts best communicate with one another.

We have introduced and developed four tests that a technical or nontechnical writer may use when deciding whether to revise a noun compound. The tests bid writers ask themselves whether the

compound (1) falls within the reader's knowledge (2) functions as a common usage (3) packages ideas efficiently, and (4) is stylistically efficacious. We have seen that not all the tests are equally decisive for all types of writing, and that, in particular, tests (2) and (4) make most sense when used to screen noun compounds in nontechnical domains, even though test (4) is largely unstudied in technical settings; test (3), on the other hand, is crucial for revising compounds that appear in technical domains. Only test (1), the test of reader knowledge, decisively applies to the revision of noun compounds across technical and nontechnical environments.

This last result underscores what is perhaps the most important point we offer in this paper. To know when to revise a noun compound, writers must know something about its "intrinisic" properties, such as its length and the number of different meanings it carries in isolation. But the most important knowledge they will need is "extrinsic"--<u>who</u> must understand the compound and to what purpose?

The question remains, even if a writer knows or can find out the general (educational, social-cultural) background of a reader, how can the writer use this information in reliably applying the aforementioned revision tests? The crucial word here is "reliably." It is one thing to know that a reader has a certain education and a certain set of cultural experiences. It

is quite another to determine from this knowledge that the same reader, as a result of this background, will understand a particular noun compound either with ease or difficulty. The gap here demonstrates an important distinction between theories of prescriptive style and comprehension.

Theories of prescriptive style presuppose, but do not determine, a theory of comprehension. In this paper, for example, we have offered a theory of prescriptive style. More, we have presupposed that the tests we have put forth can be explained by a theory of how readers actually understand noun compounds. But we have not tried to specify what that theory of comprehension looks like, nor have we cited or produced our own empirical evidence that traces dependencies between how readers understand noun compounds and the knowledge on which readers most rely to inform their understanding.

Our approach suggests that such theories can and need to be developed if we are to give the writer a better understanding of how a reader's knowledge influences his or her understanding of noun compounds. And this enriched understanding will lead writers to more specific heuristics for revising noun compounds in the face of one targeted readership or another.

[1] Style: Ten Lessons in Clarity and Grace, (Glenview, Illinois: Scott, Foresman, 1981), pp. 22-25.

[2] In this paper, we mean by revision of a noun compound any type of corrective modification. The modification may involve unpacking the same words across a more syntactically complex expression (e.g., unpacking "computer simulation games" into "games simulated on computers" or "simulation of computer games" or "games that are simulated on computers"). Or it may involve replacing the compound with different words and in different quantities (e.g., replacing "user input/output access facility" with "user window"; replacing "direct injector stratified charge engine" with several paragraphs of clarifying prose).

[3] In the sixties, R.B. Lees argued that noun compounds are transformationally derived from phrases and clauses, and he offered a comprehensive taxonomy of these forms. See The Grammar of English Nominalizations Indiana University Research Center in Anthropology, Folklore, and Linguistics, Publication No. 12, 1960. For a more recent linguistic treatment of noun compounds, see P. Downing, "On the Creation and Use of English Compound Nouns," Language 53 (1977), 810-842.

[4] David McNeil, "Speaking of Space," Science 152 (May 13 1966), 875-880.

[5] The question arises, "How can a writer decide whether a noun compound which is common to her is actually common to others?" Ultimately the ability of a writer to determine whether or not something is in common usage depends on his paying constant attention to how language is used--in the culture, more narrowly in her profession, and more narrowly still in the variety of sub-groups and sub-cultures in which she moves. It is trivial, but not unnecessary to say that the only way for one to be sensitive to how people use language is to become sensitive to language itself.

[6] McNeil, p. 877. There is a close relation between noun compounds used as names and acronyms. Often a writer will turn a nominalized name (e.g. Project Budget Officer) into an acronym (PBO) and then use the acronym as the referring expression for the name.

[7] Francis Christensen, "A Generative Rhetoric of the Sentence," in Notes Toward a New Rhetoric, (New York: Harper and Row), 1967, pp. 23-44.

[8] Richard A. Lanham, Revising Prose (New York: Charles Scribner's, 1979), passim.

[9] Williams, pp. 22-25.

[10] McNeil, p. 877.

[11] Williams, pp. 22-25.